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EXAMINER

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.



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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/588,390
Filing Date: August 04, 2006
Appellant(s): MIHAN ET AL.

Shahram Mihan et al.
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed August 10th, 2009 appealing from the Office action mailed February 3rd, 2009

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(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

US6,329,315 Denton et al. 12-2001

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

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Claim Rejections - 35 USC § 102

. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3 **Claims 1-19** are rejected under 35 U.S.C. 102(b) as being anticipated by Denton et al. (6,329,315). Denton teaches a method of making agglomerated supports, especially olefin polymerization catalyst supports with a median particle size in the range of 0.05 to about 3 microns. The process is a hydrogel process with milling step, slurry mixing and spray drying (Col 8, ln 18-55)). Denton's teaching encompasses the process steps of the claims (Col .8, 9).

4 **Regarding claims 1, 15, 18.** Denton teaches Silica hydrogel process for a support catalyst used in olefin polymerization, with milling (dry or wet as option) before spray drying. The goal of the milling procedure is to provide the inorganic oxides the optimum distribution span of the particles sizes, typically from 0.5 to about 3.0 microns,

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preferably from about 4 to 7 microns (Col 9, line 62-67). The process steps and the support catalysts size range overlap the claims therefore anticipated by Denton.

Denton discloses the particle size Distribution span per equation 1 (Col 10, ln,5), wherein D_{10} , D_{50} , D_{90} represented the 10th, 50th, and 90th percentile, respectively of the particle size (Diameter) distribution, i.e. a D_{90} of 100 microns means that 90 volume % of the particle have diameter less than or equal to 100 microns. And, per table 1, col 24, the PSD (Particle Size distribution) D_{10} is 2.6 micron (the claim is at least 5% by volume has a range of $> 0 \mu\text{m}$ to $\leq 3 \mu\text{m}$), D_{50} is 5.6 micron (the claim is at least 40% by volume has a range on $> 0 \mu\text{m}$ to $\leq 12 \mu\text{m}$) and D_{90} is 9.5 micron (the claim is at 75% by volume has a range of $> 0 \mu\text{m}$ to $\leq 35 \mu\text{m}$). The volume ranges are overlapped therefore anticipated.

5 Regarding claims 2, 4. Denton teaches "*the most preferred supports contain at least 95% by weight, silica gel, based on the weight of the catalyst support*" (Col. 6, line 32). He further teaches that "*the average particle size of the powder be located toward the low end of the 3-10 micron rangeBy controlling the average particle size in this fashion, one increases the probability that the compressive forces exerted on the constituent particles during spray drying will be high enough to cause them to adhere.*" (col. 10, line 45-53). He does not use "by volume"; however he does encompass the claims by using "by weight" instead. As the weight ranges disclosed by Denton are overlapped with the volume ranges of the claims, they are anticipated.

6 Regarding claim 3. . Denton teaches a 15-25% by weight of the particles is oxides (Col. 11, line 5) with further limiting to 10-20% (Claim 14). The claims range is

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0-25% by weight with further limiting to 9-12%. The ranges overlap therefore anticipated.

7 Regarding claim 5. Denton teaches a distribution span to the particles in the slurry to be spray dried from 0.5 to about 3.0 and preferably from about 0.5 to about 2.0 microns. The teaching encompasses the claims of 0-2.8 microns (Col 9, line 67, Col.10, ln 1).

8 Regarding claim 6. Denton teaches inorganic hydroxides, oxides and/or salts such as SiO₂, Al₂O₃, MgO, AlPO₄, TiO₂, ZrO₂, Or₂O₃, and mixture thereof Col6,line4). The same teaching as the instant claims.

9 Regarding claim 7. Since the claims can have a zero percent of the oxides. These claims are not considered. Furthermore, Denton does mention that "if the inorganic oxides are not susceptible to gel formation, the free oxide can be mixed from other conventional techniques such as precipitation, or just admixing directly for the milling procedure after washing. (Col 8, line 28) .

10 Regarding claim 8. As an option of wet milling, Denton teaches to use 4-40% by weight of the solid of Al₂O₃ or AlPO₄, same aluminum oxides as AlOOH at 1-30% as claimed. The same aluminum oxides as claimed and the range overlaps therefore encompassed by Denton's teachings. (Co16, line40-49).

Regarding claim 9. Denton teaches a support catalyst wherein alkaline earth metals of Group IIA, and VIA can be added in "slight proportions" with the silica hydrogel particles prior to milling. Ca(OH)₂ and Mg(OH)₂ added at 1%-4% . The claim

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limitation is the same as Denton has mentioned in the patent 6,329,315. (Col.8, ln.15-19)

11. Regarding claim 10. Denton also teaches "*Accordingly, in addition to those powders or particles having catalytic properties, there may be added materials which possess absorbent properties...*" (Col9, line 30). Hydroxyl methyl cellulose is a hydrophobic product possessed absorbent properties well known in the art. Denton's teaching encompasses the claims.

12. Regarding claim 11. Denton teaches a range of 4-20% of solid contents in the slurry before spray drying. The teaching encompasses the claimed ranges of less than 20%, with further limiting to 8-10 %...(co110, line17)

13. Regarding claim12. Denton also teaches spray drying (Col 6, ln 59)

14. Regarding claim 13. Denton teaches that" *...the spray dried product is characterized in that typically at least 80, preferably at least 90, and most preferably at least 95 volume % at that fraction of the support agglomerate particle size distribution possesses microspheroidal shape*" i.e. 0.5-3.0 microns in this instant. This is the same as the claim "of 5% by volume of the support particles obtained after drying have a particle size in the ranger of 0-25 microns (Co1.12, line 41).

15. Regarding claim 14. Denton teaches a mean particle size of the agglomerates of 20-120 microns. The teaching encompasses the instant claims (Col.15, line 2).

16. Regarding claim 16. Denton teaches a high Silicon content of 15-40% (Col.8, line 50).

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17. Regarding claim 17. Denton teaches a support with at least 80% by weight is the inorganic oxides such as aluminum content as the instant claims (see claim 8).

18. Regarding claim 19. Denton teaches the catalyst for olefin polymerization. (Col 19, line 20).

(10) Response to Argument

Argument #1: Applicant argues that Denton's process does not involve milling a hydrogel. Denton is a dry mill of inorganic oxide and there is no water. In column 8, line 30-55, Denton discloses the catalyst support agglomerate particles are silica hydrogel, "a silica hydrogel, also known as silica aquagel, is a silica gel formed in water which has its pores filled with water". Denton further teaches the preparation of the silica gel "which is prepared by conventional means such as by mixing an aqueous solution of an alkali metal silicate (sodium silicate, i.e. water glass) with a strong acid such as nitric acid or sulfuric acid" the same method as disclosed in the applicant's specification on page 4. As for milling, he teaches two available options: dry mill and wet mill. The claim of step (b) is "milling the hydrogel" of which Denton discloses the same as mentioned above. Furthermore, in Column 11, line 56, Denton clearly points out that "Dry milling typically does not produce colloidal silica"..and "colloidal particles within the wet milled material is the primary source of the colloid content in the slurry..". So clearly, Denton teaches a hydrogel as colloidal silica is a hydrogel. The arguments of inorganic oxides and "dry milling" are irrelevant as they are not in the claim.

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Argument #2: Particle sizes defined in Appellant's claims refer to the sizes of the hydrogels while the particle size taught by Denton refers to the size of dry gels. As discussed above, Denton discloses a silica hydrogel and in column 10 line 1-65, Denton discloses a colloidal content distribution (volume %) and requirement. The examiner construes "finely particulate hydrogel" of the claim as the same as Denton's "colloidal content". Furthermore, in table 2, column 25, Denton shows clearly the colloidal content in volume % in PSD (Particle size distribution in volume %) such as D10/D50/D90 of 2.7/4.8/8.0. which is construed to be 10 % by volume of particles has a size of 2.7 μm (meeting the claim of "at least 5% by volume has particle size of 0-3 μm "); 50 % by volume of particles has a size of 4.8 μm (meeting "at least 40% by volume in the range of 0- 12 μm "), and 90 % by volume of particle has a size of 8.0 μm (meeting "at least 75% by volume of particles in the range of 0- 35 μm ").

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/COLETTE NGUYEN/

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